REMARKS

In the Office Action, the Examiner noted that claims 1-10, 13, and 31-32 are pending in the application, and that claims 1-10, 13, and 31-32 are rejected. All claims are unamended by this response.

In view of the following discussion, the Applicants submit that none of the claims now pending in the application are obvious under the provisions of 35 U.S.C. § 103. Thus, Applicants believe that all of these claims are now in condition for allowance.

III. REJECTION OF CLAIMS UNDER 35 U.S.C. §103(a)

The Examiner rejected claims 1-10, 13, 31, and 32 as being unpatentable over Eyal (United States patent 6,484,199, issued November 19, 2002) in view of Herz (United States patent 6,029,195, issued February 22, 2000). The rejection is respectfully traversed.

The Examiner alleges that as per claim 1, Eyal teaches all of the aspects of the Applicants' invention except that Eyal does not teach multicasting from the content server at least one of the SM objects hosted thereon to a fraction of the plurality of HSs in the network, the fraction being determined according to the SM object's hotness category. However, the Examiner cites Herz for teaching multicasting from the content server at least one of the SM objects hosted thereon to a fraction of the plurality of HSs in the network, the fraction being determined according to the SM object's hotness category. The Applicants respectfully disagree.

The Applicants agree with the Examiner that Eyal fails to teach, suggest or make obvious multicasting from the content server at least one of the SM objects hosted thereon to a fraction of the plurality of HSs in the network, the fraction being determined according to the SM object's hotness category as taught in the Applicants' specification and claimed by at least the Applicants' claim 1. Furthermore the Applicants respectfully submit that Eyal fails to teach, suggest or make obvious further aspects of at least the Applicants' claim 1. More specifically, the Applicants' claim 1 specifically recites:

"A method for distributing a streaming multimedia (SM) object in a network having a content server which hosts SM objects for distribution over said network through a plurality of helpful servers (HSs) to a plurality of clients, said method comprising:

calculating at said content server a server hotness rating for said SM objects hosted thereon;

performing a categorization process, wherein each of said SM objects hosted by said content server are categorized into one of a plurality of server hotness categories based on each of said SM object's calculated server hotness rating; and

multicasting from said content server at least one of said SM objects hosted thereon to a fraction of said plurality of HSs in the network, said fraction being determined according to said SM object's hotness category."

The Applicants respectfully submit that there is absolutely no teaching, suggestion or disclosure in Eyal for at least a "hotness rating" as taught in the Applicants' specification and claimed by at least the Applicants' claim 1. In support of at least claim 1, the Applicants, in the Specification, specifically recite:

"A first aspect for describing cache placement and replacement policies of the present invention is the helper hotness rating. Caching systems for SM objects attempt to reduce end-to-end delay, server load and network load by distributing the SM objects among the HSs 22-24 located closest to the clients 26-40. It is not feasible, however, to replicate all SM objects in all the HSs 22-24 in the network 12 due to limited disk space on the HSs 22-24. From the HSs' 22-24 point of view, given the limited disk space, a metric is required to identify those SM objects which are more frequently requested by clients 26-40 for cache storage at the HSs 22-24. A SM object is defined to be "hot" if a large number of client requests arrive at the HS 22-24 in a short period of time. Accordingly, each SM object is assigned a helper hotness rating at each HS 22-24 in the network at which the object is cached, defined by:

helper hotness rating = (total # of client requests for the SM object) /
time span over which the requests are received at the HS

(1)

This equation illustrates that high client demand for an SM object equates to a high helper hotness rating. The helper hotness rating is a local measure (i.e., local to the HS) representing how popular a SM object is among clients 26-40 served by the HS." (See Applicants' Specification, page 9, line 15 through page 10, line 9).

The Applicants further recite:

"In general, the role of the HSs 22-24 is to reduce network congestion by preventing client requests from going to the content server 12 whenever possible. In carrying out that responsibility, many client requests never reach the content server 12. As such, hotness as defined by equation (1) is an inappropriate metric for the content server 12. Accordingly, a more practical hotness metric, applicable to only the content server 12, is defined as:

$$\text{server hotness rating} = \sum_{\text{all HSs}} (\text{Helper hotness rating}) = h_{server} \qquad (2)$$

This equation states that, for a particular SM object, the content server metric for hotness is the sum of all the constituent helper hotness ratings for all HSs 22-24 in the network 14. That is, each HS 22-24 reports its local hotness rating to the content server 12 for inclusion in the general summation defined by Equation (2) to derive the server hotness rating." (See Applicants' Specification, page 10, line 15 through page 11, line 4).

Even further, the Applicants recite:

"This prior art approach is referred to as a rank-based approach and is successfully applied in the case of static objects. However, while the rank-based approach is a non-optimal solution for both static and SM objects. By definition, the rank-based approach requires periodic recalculation of the rank r as SM objects are added and deleted at the content server 12. In the case of SM objects, deletions and additions at the content server 12 necessitate a periodic recalculation of the rank r of the remaining objects, which results in a continuous redistribution of the fraction of HSs 22-24 the SM objects are distributed to. Accordingly, the rank-based approach of the prior art proves unstable. To reduce this instability for SM objects, the present invention uses a category-based approach.

The category-based approach is characterized, not by an objects rank r, as applied in the rank-based approach, but rather by a server hotness rating, h_{server}, maintained by the server for each SM object it is hosting. The hotness rating h_{server} can be manually assigned or collected from HSs 22-24 in the network 14, as defined by equation (2) above. Based on the SM objects hotness rating at the server, h_{server}, the content server 12 assigns the SM object to one of four categories: cold, warm, hot and very hot as follows:
SM object is cold, if its server hotness rating, $0 \le h_{server} < R_1$; warm, if its server hotness rating, $R_1 \le h_{server} < R_2$; hot, if its server hotness rating, $R_2 \le h_{server} < R_3$; very hot, if its server hotness rating, $R_3 \le h_{server}$, where $0 < R_1 < R_2 < R_3$ are input parameters.

The category-based approach is advantageous for SM objects in that object category assignments are made strictly on the basis of server hotness rating, independent of the SM object's dynamically changing rank, thereby reducing the instability associated with the prior art rank-based approach.

The category-based ranking approach if the present invention, defines what fraction of the HSs 22-24 an SM object is to be multicast to." ((See Applicants' Specification, page 15, line 5 through page 16, line 6).

It is clearly evident from at least the portions of the Applicants' Specification presented above, that the Applicants' invention is directed, at least in part, to a method and system for distributing a streaming multimedia (SM) object in a network including at least "calculating at said content server a server hotness rating for said SM objects hosted thereon" as taught in the Applicants' Specification and claimed by at least the Applicants' claim 1. More specifically, in the invention of the Applicants, a role of included helper servers (HSs) is to reduce network congestion by preventing client requests from having to go to the content server whenever possible. In the Applicants' invention, this is partially accomplished by determining a helper hotness rating. From the HSs' point of view, given the limited disk space, a metric identifies those SM objects which are more frequently requested by clients for cache storage at the HSs. This metric is defined by the Applicants as a hotness rating. An SM object is defined to be "hot" if a large number of client requests arrive at the HS in a short period of time. Accordingly, each SM object is assigned a helper hotness rating at each HS in the network. Subsequently, from each of the helper hotness ratings, a content server hotness rating is determined. That is, the content server metric for hotness is the sum of all the constituent helper hotness ratings for all HSs in a network. Each HS reports its local hotness rating to the content server for inclusion in a general summation used to derive the server hotness rating.

In the invention of the Applicants, a category-based approach is characterized, not by an objects rank as applied in prior art rank-based approaches, but rather by a server hotness rating maintained by the content server for each SM object it is hosting. Based on the SM objects hotness rating at the server, the content server assigns the SM object to one of four categories: cold, warm, hot and very hot. The category-based

approach of the Applicants' invention is advantageous for SM objects in that object category assignments are made strictly on the basis of server hotness rating, independent of the SM object's dynamically changing rank, thereby reducing the instability associated with the prior art rank-based approach. The category-based ranking approach of the Applicants' invention is based on each of the HSs hotness ratings which are based on the frequency an SM object is requested by a user and defines what fraction of the HSs an SM object is to be multicast to.

In contrast to the Applicants' invention, there is absolutely no teaching, suggestion or disclosure in Eyal for at least multicasting from a content server at least one of the SM objects hosted thereon to a fraction of the plurality of HSs in the network, the fraction being determined according to the SM object's hotness category as taught in the Applicants' specification and claimed by at least the Applicants' claim 1. Even further, and maybe of more importance, Eyal fails to teach, suggest or make obvious a "hotness rating" as taught in the Applicants' specification and claimed by at least the Applicants' claim 1. The Examiner points to the teachings of Eyal at col. 12, lines 37-67 and col. 30, line 13 through col. 31, line 63 for teaching the "hotness rating" of the Applicants' invention. The Applicants respectfully disagree.

Eyal teaches a streaming media search and playback system where a search request is received over a network to play back media that satisfies one or more search criteria. In Eyal, a plurality of media resources are selected by comparing the search criteria to information associated with the media resources. A set of media resources is established based on the plurality of media resources. In response to termination of playback of a given media resource, playback of another media resource is automatically initiated. (See Eyal, Abstract). In the specific sections in Eyal as pointed out by the Examiner, Eyal specifically recites:

> "In step 140, metadata information is extracted from each media link. Preferably, metadata information is extracted from each verified media link. In an embodiment, metadata may also be added to a list or database of extracted metadata. Additional metadata may be added using, for example, manual interactive editing and an editor interface (see for example, editor interface module 275 in FIG. 2). Examples of metadata information include (with an

> exemplary data structure type associated with each media link in parenthetical): identification (Integer), author (String), duration (String), media URL (URL), source web site (URL), media type (Integer), rating (Real number), number of votes (Integer), verification status (Boolean), edited status (Boolean), genre type (Index into a genre database table), play-list genre status (Boolean), mix (index into mixes database table), play-list mix status (Boolean), mood (index into moods database table), description (String), clip broadcast quality (integer), image size for videos (integer, integer), and play-list mood status (Boolean). One or more of these types of metadata may be extracted from the media links or from the actual media file. For example, a media link to a web resource may be extracted for identification, duration, author, and source web site. Similarly, one or more of these types of metadata may be added to the extracted metadata information. For example, genre type and description information may be added to the extracted metadata information.
>
> In step 150, the system creates media play-lists using media database for predefined categories. In an embodiment, verified media links are structured into play-lists, such as described with FIG. 10." (See Eyal, col. 12, lines 37-67).

As evident from at least the portion of the teachings of Eyal, as presented above and pointed out by the Examiner, and throughout the teachings of Eyal, the invention of Eyal is directed to making a play-list from metadata extracted using search parameters defined by a user. In Eyal, a system creates media play-lists to be played by a user's media player using media databases for predefined categories. However, there is absolutely no teaching, suggestion or disclosure in Eyal for a hotness rating wherein an SM object is defined to be "hot" if a large number of client requests arrive at the HS in a short period of time for that particular SM object. In the invention of the Applicants, each SM object is assigned a helper hotness rating at each HS in the network. Subsequently, from each of the helper hotness ratings, a content server hotness rating is determined. There is absolutely no teaching, suggestion or disclosure in Eyal for a hotness rating as taught in the Applicants' Specification and as claimed by at least the Applicants' claim 1 or even for a media play-list that is comprised of "hot" streaming media as defined and claimed by the Applicants' invention.

Even further, in col. 30, line 13 through col. 31, line 63 of Eyal, as pointed out by the Examiner, Eyal teaches that media clips to be listened to or listed in a play-list may be rated by user preference. The Examiner cites this portion of Eyal for teaching the hotness rating of the Applicants' invention. However, as clearly pointed out throughout

the Applicants' Specification and at least by the portions of the Applicants' Specification presented above, the hotness rating of the Applicants' invention is not related to a user preference rating but instead to SM objects which are more frequently requested by clients for cache storage at the HSs. There is absolutely no teaching, suggestion, or disclosure in Eyal for such hotness rating as taught in the Applicants' Specification and claimed by at least the Applicants' claim 1. Eyal teaches listing media clips by user rating and votes received for that media clip, but the Applicants herein respectfully submit that ratings based on votes received for specific media clips do not teach, suggest or disclose a hotness rating which defines the SM objects which are more frequently requested by clients for cache storage at the HSs. **That is, a user may rate a media clip with a high rating or vote for a media clip more than once because he/she likes that movie but that does not mean that the highly rated or voted on media clip is one that is most frequently requested by a client or clients. For example, a client may rate highly or vote more than once for a specific movie, but instead request a short clip or video more often than the movie highly rated or voted for because they do not have time to watch the entire movie and/or prefer to watch a short clip more often. Even further, if more movies or songs are added to a play-list, a user rating or preference list may have to be updated frequently as described in the Applicants' Specification as a problem with a prior art rating system. However, by using a category-based approached (e.g., and a hotness rating as taught and claimed by the Applicants), a rating list does not have to be updated as in the prior art because the storage of SM objects is based on the most frequently requested SM objects (i.e., the hotness rating) and not a user specified ratings list as taught in Eyal.**

Furthermore, the Applicants respectfully submit that Eyal fails to teach, suggest or make obvious the helpful servers (HSs) of the Applicants' invention. More specifically, the Applicants teach and claim "multicasting from said content server at least one of said SM objects hosted thereon to a fraction of said plurality of HSs in the network" in at least claim 1. The Examiner concedes that Eyal does not teach, suggest or disclose "multicasting from said content server at least one of said SM objects hosted

thereon to a fraction of said plurality of HSs in the network", but the Applicants' further submit that Eyal does not even teach, suggest or disclose the helpful servers as taught in the Applicants' Specification and claimed by at least the Applicants' claim 1. In support of the helpful servers of claim 1, the Applicants specifically recite:

> "Helper Server (HS): a HS, also referred to as a helper, is one of a plurality of servers in the network that provide certain value-added services. For example, a HS can provide caching services and/or prefetching services. HSs selectively cooperate and communicate SM objects (or segments of such objects) between and among each other and between content servers and clients. That is, the HS understands an SM object's transmission requirements and can behave, in some respects, like a content server." (See Specification, page 7, lines 6-11).

And

> "The network further includes HS 22-24. Each HS 22-24 is configured as a conventional database server having processing capabilities, including a CPU (not shown) and storage. HSs 22-24 cache Internet resources, such as those requested by client computers 26-40 that have been downloaded from the content server 12 to allow localized serving of those resources." (See Specification, page 9, lines 1-5).

The Applicants submit that there is absolutely no teaching, suggestion or disclosure in Eyal for HSs including a CPU and storage for caching Internet resources, such as those requested by client computers that have been downloaded from a content server to allow localized serving of those resources as taught in the Applicants' Specification and claimed by at least the Applicants' claim 1.

In addition, the Applicants respectfully submit that there is absolutely no suggestion or motivation to combine the teachings of Eyal and Herz. More specifically, for prior art reference to be combined to render obvious a subsequent invention under 35 U.S.C. § 103, there must be something in the prior art as a whole which suggests the desirability, and thus the obviousness, of making the combination. Uniroyal v. Rudkin-Wiley, 5 U.S.P.SQ.2d 1434, 1438 (Fed. Cir. 1988). **The teachings of the references can be combined only if there is some suggestion or incentive in the prior art to do so.** In re Fine, 5 U.S.P.SQ.2d 1596, 1599 (Fed. Cir. 1988). **Hindsight is strictly forbidden.** It is impermissible to use the claims as a framework to pick and choose

among individual references to recreate the claimed invention Id. at 1600; W.L. Gore Associates, Inc., v. Garlock, Inc., 220 U.S.P.Q. 303, 312 (Fed. Cir. 1983).

Moreover, the mere fact that a prior art structure could be modified to produce the claimed invention would not have made the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992); In re Gordon, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). Again, the Applicants strongly submit that there is absolutely no motivation or suggestion in either Eyal or Herz for the combination of the references in an attempt to teach or make obvious the invention of the Applicants at least with regard to claim 1. That is, the Applicants submit that there is not motivation to combine the streaming media search and playback system of Eyal with the system for customized electronic identification of Herz in an attempt to teach or make obvious the invention of the Applicants.

Even further, the Applicants strongly submit that even if a motivation or suggestion to combine the references did exist (which the Applicants strongly believe that no such motivation or suggestion exist) any allowable combination of the references fails to teach, suggest or make obvious the invention of the Applicants, at least with respect to claim 1. More specifically, Herz teaches customized electronic identification of desirable objects, such as news articles, in an electronic media environment, and in particular a system that automatically constructs both a "target profile" for each target object in the electronic media based, for example, on the frequency with which each word appears in an article relative to its overall frequency of use in all articles, as well as a "target profile interest summary" for each user, which target profile interest summary describes the user's interest level in various types of target objects. The system of Herz then evaluates the target profiles against the users' target profile interest summaries to generate a user-customized rank ordered listing of target objects most likely to be of interest to each user so that the user can select from among these potentially relevant target objects, which were automatically selected by this system from the plethora of target objects that are profiled on the electronic media. (See Herz, Abstract). However, Herz, alone, also fails to teach, suggest or make obvious at least the "hotness rating" of the Applicants' invention and further the HSs of

the Applicants' invention at least as taught in the Applicants' Specification and claimed by at least the Applicants' claim 1.

As such, because Eyal alone does not teach, suggest or make obvious the invention of the Applicants and specifically the Applicants' claim 1 for at least the reasons described above relating to the "hotness rating" of the Applicants' invention and further the HSs of the Applicants' invention and even further and as conceded by the Examiner "multicasting from the content server at least one of the SM objects hosted thereon to a fraction of the plurality of HSs in the network, the fraction being determined according to the SM object's hotness category" as taught and claimed by the Applicants' invention, and because Herz, alone, also fails to teach, suggest or make obvious the invention of the Applicants and specifically the Applicants' claim 1 for at least the "hotness rating" of the Applicants' invention and further the HSs of the Applicants' invention, any allowable combination of Eyal and Herz also fails to teach, suggest or make obvious the invention of the Applicants as taught in the Applicants' Specification and claimed by at least the Applicants' claim 1. More specifically, the Applicants submit that the teachings of Herz fail to bridge the substantial gap between the teachings of Eyal and the invention of the Applicants.

As such, the Applicants submit that the teachings of Eyal and Herz, alone or in any allowable combination, (which the Applicants submit that no motivation or suggestion to combine exists) do not make obvious the invention of the Applicants, at least with respect to independent claim 1.

Therefore, the Applicants submit that claim 1, as it now stands, fully satisfies the requirements under 35 U.S.C. §103 and is patentable thereunder.

Likewise, independent claims 5, 9 and 13 recite similar relevant features as those recited in claim 1. As such, the Applicants respectfully submit that independent claims 5, 9 and 13, as they now stand, also fully satisfy the requirements of 35 U.S.C. § 103 and are patentable thereunder.

Furthermore, dependent claims 2-4, 6-8, 10, 31 and 32 depend either directly or indirectly from independent claims 1, 5 and 9, respectively, and recite additional features thereof. As such, and for at least for the reasons recited above, the Applicants

submit that these dependent claims are also not obvious and fully satisfy the requirements under 35 U.S.C. §103 and are patentable thereunder.

The Applicants reserve the right to establish the patentability of each of the claims individually in subsequent prosecution.

CONCLUSION

Thus, the Applicants submit that none of the claims presently in the application are obvious under the provisions of 35 U.S.C. § 103. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring any adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Jorge Tony Villalbon, Esq. at (732) 530-9404 x 1131 or Mr. Eamon J. Wall, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

Eamon J. Wall Attorney
Reg. No. 39,414

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CUSTOMER #46,363
MOSER, PATTERSON & SHERIDAN, LLP
595 Shrewsbury Avenue, Suite 100
Shrewsbury, New Jersey 07702
732-530-9404 - Telephone
732-530-9808 – Facsimile